



Docket No.: 057454-0964

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Customer Number: 20277
Hideto HIDAKA : Confirmation Number: 1384
Application No.: 10/615,379 :
Patent No.: 6,975,534 : Group Art Unit: 2824
Filed: July 09, 2003 : Examiner: Nguyen, Van Thu T
For: THIN FILM MAGNETIC MEMORY DEVICE HAVING A HIGHLY INTEGRATED
MEMORY ARRAY

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 CFR 1.322

Mail Stop COC
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate
MAR 13 2006
of Correction

Sir:

In reviewing the above-identified patent, a printing error was discovered therein requiring correction in order to conform the Official Record in the application.

The error noted is set forth on the two attached copies of form PTO-1050 Rev. 2-93 in the manner required by the Commissioner's Notice.

Specifically, **On the Title page of the Letters Patent:, Under "(56) References Cited, U.S. PATENT DOCUMENTS", add:, -- 5,276,650 1/1994 Kubota, and 5,619,447 4/1997 Tai --, Under "(56) References Cited, OTHER PUBLICATION", add:**

-- SCHEUERLEIN, Roy E. et al., "Shared Word Line DRAM Cell", IEEE Journal of Solid- State Circuits, Vol. 19, No. 5, October 1984, pp. 640-645,

MAR 13 2006

TEHRANI, S. et al., " Recent Developments in Magnetic Tunnel Junction MRAM", IEEE Transactions on Magnetics, Vol 36, No. 5, September 2000, pp. 2752-2757 --,

Under "(56) References Cited, OTHER PUBLICATION", change " Schauerlein" to -- Scheuerlein -- and " Durlarn " to -- Durlam --, and add original claims 20 -- 24 listed on the attached form PTO 1050.

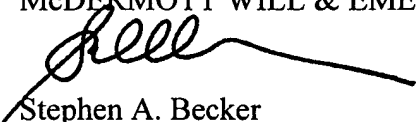
For your immediate reference attached is a photocopy of two Examiner's Initialed 1449's, a return stamped postcard for filing a Preliminary Amendment on 6/28/2005, the Preliminary Amendment dated 6/28/2005 and a Supplemental notice of Allowability in regards to Claims 20-24.

The change requested herein occurred as a result of printing the Letters Patent and the Certificate should be issued without expense under Rule 322 of the Rules of Practice. Accordingly, Applicants request issuance of the Certificate of Correction.

Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP


Stephen A. Becker
Registration No. 26,527

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 SAB:JGH
Facsimile: 202.756.8087
Date: March 9, 2006

**Please recognize our Customer No. 20277
as our correspondence address.**

MAR 13 2006

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6975534
DATED : December 13, 2005
INVENTOR(S) : Hideto HIDAKA

Page 1 of 6

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

On the Title page of the Letters Patent:

Under "(56) References Cited, U.S. PATENT DOCUMENTS", add:

-- 5,276,650 1/1994 Kubota,
5,619,447 4/1997 Tai --

Under "(56) References Cited, OTHER PUBLICATION", add:

-- SCHEUERLEIN, Roy E. et al., "Shared Word Line DRAM Cell", IEEE Journal of Solid-State Circuits, Vol. 19, No. 5, October 1984, pp. 640-645,

TEHRANI, S. et al., "Recent Developments in Magnetic Tunnel Junction MRAM", IEEE Transactions on Magnetics, Vol 36, No. 5, September 2000, pp. 2752-2757 --

Under "(56) References Cited, OTHER PUBLICATION", change "Schauerfein" to -- Scheuerlein -- and "Durlarn" to -- Durlam --

MAILING ADDRESS OF SENDER:
McDermott Will & Emery LLP
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PATENT NO.
6,975,534

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6975534

Page 2 of 6

DATED : December 13, 2005

INVENTOR(S) : Hideto HIDAKA

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

Under " What is claimed is:", add:

20. (New) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in every other memory cell row and every other memory cell column such that each memory cell of said plurality of memory cells is separated from another by an adjoining memory cell location in a row direction and an adjoining memory cell location in a column direction, each of said plurality of magnetic memory cells including
a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;
a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow there through;
a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;
a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow there through in said data write operation; and
a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow there through in said data read operation, wherein
adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines.

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FORM PTO 1050 (Rev. 2-93)

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6975534

Page 3 of 6

DATED : December 13, 2005

INVENTOR(S) : Hideto HIDAKA

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

21. (New) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;
a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;
a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and
a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein
adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
wherein
said adjacent magnetic memory cells share one of the corresponding write word line and the corresponding write data line, which is located farther from the respective magnetic storage portions, and
said one of the write word line and the write data line has a larger cross-sectional area than that of the other of the write word line and the write data line.

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CERTIFICATE OF CORRECTION

PATENT NO. : 6975534
 DATED : December 13, 2005
 INVENTOR(S) : Hideto HIDAHA

Page 4 of 6

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

22. (New) A thin film magnetic memory device, comprising:
 a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein one of each write word line and each write data line, which is located farther from the corresponding magnetic storage portions, is formed from a material having higher electromigration resistance than that of the other of each write word line and each write data line.

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CERTIFICATE OF CORRECTION

PATENT NO. : 6975534

Page 5 of 6

DATED : December 13, 2005

INVENTOR(S) : Hideto HIDAHA

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

23. (New) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;
a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;
a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation;
and
a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein
adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
wherein
adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of write word lines,
every two of said plurality of read data lines form a read data line pair in said data read operation, the magnetic memory cells selected by a same read word line are respectively connected to one of the two read data lines of each of said read data line pairs, and
said data read current is supplied to each of the two read data lines of the read data line pair corresponding to a column selection result.

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CERTIFICATE OF CORRECTION

PATENT NO. : 6975534
 DATED : December 13, 2005
 INVENTOR(S) : Hideto HIDAHA

Page 6 of 6

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

24. (New) A thin film magnetic memory device, comprising:
 a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
 a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;
 a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
 a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;
 a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and
 a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein
 adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
 wherein
 adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of read word lines,
 every two of said plurality of write data lines form a write data line pair in said data write operation, the magnetic memory cells selected by a same write word line are respectively connected to one of the two write data lines of each of said write data line pairs, and
 said second data write current is supplied to each of the two write data lines of the write data line pair corresponding to a column selection result as currents of opposite directions.

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FORM PTO 1050 (Rev. 2-93)

INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449)				ATTY. DOCKET NO. 57454-964		SERIAL NO. Divisional of Appl. No. 09/832,025	
				APPLICANT Hideto HIDAKA			
				FILING DATE July 09, 2003		GROUP 2824	

U.S. PATENT DOCUMENTS						
EXAMINER'S INITIALS	CITE NO.	Document Number Number-Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	
VTN		US 6,359,805 B1	03/19/2002	Hidaka		
		US 5,650,958	07/22/1997	Gallagher et al.		
		US 5,640,343	06/17/1997	Gallagher et al.		
		US 5,734,605	03/31/1998	Zhu et al.		
		US 5,835,314	11/10/1998	Moodera et al.		
		US 6,349,054	02/2002	Hidaka		
		US 3,849,768	11/1974	Durvasula		
		US 5,946,227	08/1999	Naji		
		US 6,055,178	04/2000	Naji		
		US 6,111,781	08/2000	Naji		
VTN		US 6,278,631	08/2001	Naji		

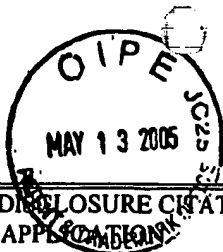
FOREIGN PATENT DOCUMENTS						
EXAMINER'S INITIALS	CITE NO.	Foreign Patent Document Country Codes - Number - Kind Codes (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Figures Appear	Translation
						<input type="checkbox"/> Yes <input type="checkbox"/> No

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)		
EXAMINER'S INITIALS	CITE NO.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.
VTN		Roy Scheuerlein, et al. "A 10ns Read and Write Non-Volatile Memory Array Using a Magnetic Tunnel Junction and FET Switch in Each Cell", ISSCC Digest of Technical Papers, TA7.2, February 2000, pp. 128-129, 94-95 and 409.
VTN		M. Durlam et al., "Nonvolatile RAM Based on Magnetic Tunnel Junction Elements", ISSCC Digest of Technical Papers, TA7.3, February 2000, pp. 130-131, 96-97, 410-411.

EXAMINER 	DATE CONSIDERED 7/19/04
--------------	-----------------------------------

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.



SHEET 1 OF 1

INFORMATION DISCLOSURE CITATION IN AN APPLICATION (PTO-1449)		ATTY. DOCKET NO. 057454-0964		SERIAL NO. 10/615,379	
		APPLICANT Hideto HIDAKA			
		FILING DATE July 09, 2003		GROUP 2824	
U.S. PATENT DOCUMENTS					
EXAMINER'S INITIALS	CITE NO.	Document Number Number-Kind Code2 (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
VTN		US 6,055,178	4/25/2000	Naji	
VTN		US 5,276,650	1/4/1994	Kubota	
VTN		US 5,619,447	4/8/1997	Tai	
		US			
FOREIGN PATENT DOCUMENTS					
EXAMINER'S INITIALS	CITE NO.	Foreign Patent Document Country Code3 - Number 4 -Kind Code5 (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines Where Relevant Figures Appear
OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)					
EXAMINER'S INITIALS	CITE NO.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			
VTN		SCHEUERLEIN, Roy E. et al., "Shared Word Line DRAM Cell", IEEE Journal of Solid-State Circuits, Vol. 19, No. 5, October 1984, pp. 640-645			
VTN		TEHRANI, S. et. al., "Recent Developments in Magnetic Tunnel Junction MRAM", IEEE Transactions on Magnetics, Vol. 36, No. 5, September 2000, pp. 2752-2757			
EXAMINER <i>[Signature]</i>			DATE CONSIDERED 8/8/05		

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.
1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Applicant: **Hideto HIDAKA**

Docket No. **057454-0964**

Serial No. **10/615,379**

Title: **THIN FILM MAGNETIC MEMORY DEVICE HAVING A HIGHLY INTEGRATED MEMORY ARRAY**

Date Sent: **6/28/2005**

Patent No. _____

☒ Transmittal Letter

☐ New Patent App

☐ Other: _____

☐ Hand Carried

☐ Fax

☐ Electronic

☐ Cert. of Mailing

☐ First Class Mail

☐ Express Mail No. _____

☐ Utility

☐ Design

☐ Cont.

☐ CIP

☐ Div.

☐ PCT

☒ RCE

☐ Prov

☐ Letter submitting _____ pages of drawings

☐ Req. for Approval of Drawing Amendments

☐ Req. for Oral Hearing

☐ Not. of Appeal

☐ Appeal Brief

☐ Reply Brief

☐ Rule 312 Amendment/Letter

☐ Req. for Acknowledgement of Cited Art

☐ Issue Fee

☐ Publication Fee

☐ Req. for Certificate of Correction

☐ Maintenance Fee for _____ years after grant

☐ Fee Address Indication Form

☐ Terminal Disclaimer

☐ Petition to Commissioner

☐ Status Inquiry

☐ Other _____

_____ pages of Specification

_____ pages of Claims

_____ pages of Abstract

_____ pages of Formal/Informal Drawings

☐ Small Entity

☐ Large Entity

☐ Declaration/Power of Attorney

☐ Recordation of Assignment/Security Agreement

☐ Information Disclosure Statement

Form PTO 1449

_____ copies of cited references

☒ Preliminary Amendment

☐ Response to Missing Parts Notice

☐ Resp. to Notice to Correct App. Papers

☐ Certified Copy of Priority Doc.

☐ Claim for Convention Priority

☐ Response/Amendment to Office Action of

☐ Request for _____ month Extension of Time

Check for \$ _____

☐ Charge Deposit Acct. 500417

\$ 1790.00

Atty Init.

SAB

Tkpr. #

4233

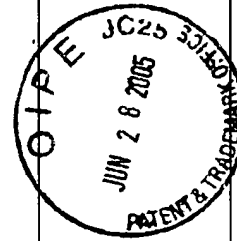
Secy. or PL:

CM. Shiflett

CMS Descrip.: **#1 = \$790.00**

#3 = \$1,000.00

THE PATENT AND TRADEMARK OFFICE DATE STAMPED HEREON IS ACKNOWLEDGEMENT THAT THE ITEMS, CHECKED ABOVE, WERE RECEIVED BY THE PTO ON THE DATE STAMPED.



MAR 13 2006

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	10/615,379
Filing Date	July 09, 2003
First Named Inventor	Hideto HIDAKA
Art Unit	2824
Examiner Name	Nguyen, Van Thu T
Attorney Docket Number	057454-0964

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Education (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. **Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

- a. ☐ Previously submitted If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ii. ☐ Other _____
- b. ☒ Enclosed
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/Declaration(s)
- iii. ☐ Information Disclosure Statement (IDS)
- iv. ☐ Other _____

2. Miscellaneous

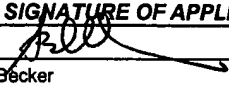
- a. ☐ Suspension of action of the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
- b. ☐ Other _____

3. Fees

- The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
- a. ☒ The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 500417. I have enclosed a duplicate copy of this sheet.
- i. ☒ RCE fee required under 37 CFR 1.17(e) \$790
- ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)
- iii. ☒ Other Additional Claims Fee \$1,000.00
- b. ☐ Check in the amount of \$ _____ enclosed
- c. ☐ Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature		Date	June 28, 2005
Name (Print/Type)	Stephen A. Becker	Registration No.	26,527

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature		Date	
Name(Print/Type)			

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

MAR 13 2006

Docket No.: 057454-0964

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
	:	
Hideto HIDAKA	:	Confirmation Number: 1384
	:	
Application No.: 10/615,379	:	Group Art Unit: 2824
	:	
Filed: July 09, 2003	:	Examiner: Nguyen, Van Thu T
	:	

For: THIN FILM MAGNETIC MEMORY DEVICE HAVING A HIGHLY INTEGRATED
MEMORY ARRAY

AMENDMENT

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please amend the above-identified application as follows:

MAR 13 2006

IN THE CLAIMS

Claims 1-12 (Cancelled)

13. (Previously Presented) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in every other memory cell row and every other memory cell column such that each memory cell of said plurality of memory cells is separated from another by an adjoining memory cell location in a row direction and an adjoining memory cell location in a column direction, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field, and

a memory cell selection gate for passing a data read current therethrough into said magnetic storage portion in a data read operation;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, for actuating the corresponding memory cell selection gate according to a row selection result in said data read operation;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines.

14. (Previously Presented) A thin film magnetic memory device, comprising:

- a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
 - a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field, and
 - a memory cell selection gate for passing a data read current therethrough into said magnetic storage portion in a data read operation;
- a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
- a plurality of read word lines provided corresponding to the respective rows, for actuating the corresponding memory cell selection gate according to a row selection result in said data read operation;
- a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and
- a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein
 - adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
 - wherein
 - said adjacent magnetic memory cells share one of the corresponding write word line and the corresponding write data line, which is located farther from the respective magnetic storage portions, and
 - said one of the write word line and the write data line has a larger cross-sectional area than that of the other of the write word line and the write data line.

15. (Previously Presented) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field, and
a memory cell selection gate for passing a data read current therethrough into said magnetic storage portion in a data read operation;
a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
a plurality of read word lines provided corresponding to the respective rows, for actuating the corresponding memory cell selection gate according to a row selection result in said data read operation;
a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and
a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
wherein one of each write word line and each write data line, which is located farther from the corresponding magnetic storage portions, is formed from a material having higher electromigration resistance than that of the other of each write word line and each write data line.

16. (Previously Presented) A thin film magnetic memory device, comprising:
a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field, and

a memory cell selection gate for passing a data read current therethrough into said magnetic storage portion in a data read operation;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, for actuating the corresponding memory cell selection gate according to a row selection result in said data read operation;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein

adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of write word lines,

every two of said plurality of read data lines form a read data line pair in said data read operation,

the magnetic memory cells selected by a same read word line are respectively connected to one of the two read data lines of each of said read data line pairs, and

said data read current is supplied to each of the two read data lines of the read data line pair corresponding to a column selection result.

17. (Previously Presented) A thin film magnetic memory device, comprising:

- a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including
 - a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field, and
 - a memory cell selection gate for passing a data read current therethrough into said magnetic storage portion in a data read operation;
- a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;
- a plurality of read word lines provided corresponding to the respective rows, for actuating the corresponding memory cell selection gate according to a row selection result in said data read operation;
- a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and
- a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,
 - wherein
 - adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of read word lines,
 - every two of said plurality of write data lines form a write data line pair in said data write operation,
 - the magnetic memory cells selected by a same write word line are respectively connected to one of the two write data lines of each of said write data line pairs, and
 - said second data write current is supplied to each of the two write data lines of the write data line pair corresponding to a column selection result as currents of opposite directions.

18. (Original) The thin film magnetic memory device according to claim 17, further comprising:

a switching circuit for electrically coupling the two write data lines of said write data line pair to each other in said data write operation, and

a data write circuit for supplying first and second voltages respectively to the two write data lines of said write data line pair corresponding to the column selection result in said data write operation.

19. (Previously Presented) The thin film magnetic memory device according to claim 13, wherein said adjacent magnetic memory cells correspond to nearest adjacent memory cells.

20. (New) A thin film magnetic memory device, comprising:

a memory array having a plurality of magnetic memory cells arranged in every other memory cell row and every other memory cell column such that each memory cell of said plurality of memory cells is separated from another by an adjoining memory cell location in a row direction and an adjoining memory cell location in a column direction, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines.



21. (New) A thin film magnetic memory device, comprising:

a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein

said adjacent magnetic memory cells share one of the corresponding write word line and the corresponding write data line, which is located farther from the respective magnetic storage portions, and

said one of the write word line and the write data line has a larger cross-sectional area than that of the other of the write word line and the write data line.



22. (New) A thin film magnetic memory device, comprising:

a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein one of each write word line and each write data line, which is located farther from the corresponding magnetic storage portions, is formed from a material having higher electromigration resistance than that of the other of each write word line and each write data line.



23. (New) A thin film magnetic memory device, comprising:

a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein

adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of write word lines,

every two of said plurality of read data lines form a read data line pair in said data read operation,

the magnetic memory cells selected by a same read word line are respectively connected to one of the two read data lines of each of said read data line pairs, and

said data read current is supplied to each of the two read data lines of the read data line pair corresponding to a column selection result.



24. (New) A thin film magnetic memory device, comprising:

a memory array having a plurality of magnetic memory cells arranged in rows and columns, each of said plurality of magnetic memory cells including

a magnetic storage portion having a resistance value that varies according to a level of storage data to be written when a data write magnetic field applied by first and second data write currents is larger than a predetermined magnetic field;

a plurality of write word lines provided corresponding to the respective rows of the magnetic memory cells, and selectively activated according to a row selection result in a data write operation so as to cause said first data write current to flow therethrough;

a plurality of read word lines provided corresponding to the respective rows, and selectively activated according to a row selection result in a data read operation so as to cause a data read current to flow through the magnetic storage portion in a selected memory cell of said plurality of magnetic memory cells;

a plurality of write data lines provided corresponding to the respective columns of the magnetic memory cells, for causing said second data write current to flow therethrough in said data write operation; and

a plurality of read data lines provided corresponding to the respective columns, for causing said data read current to flow therethrough in said data read operation, wherein

adjacent magnetic memory cells share a corresponding one of at least one of said plurality of write word lines, said plurality of read word lines, said plurality of read data lines and said plurality of write data lines,

wherein

adjacent magnetic memory cells in the column direction share a corresponding one of said plurality of read word lines,

every two of said plurality of write data lines form a write data line pair in said data write operation,

the magnetic memory cells selected by a same write word line are respectively connected to one of the two write data lines of each of said write data line pairs, and

said second data write current is supplied to each of the two write data lines of the write data line pair corresponding to a column selection result as currents of opposite directions.

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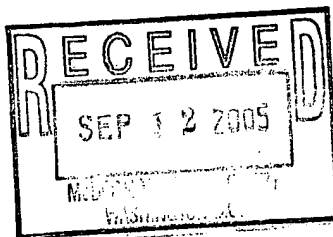
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,379	07/09/2003	Hideto Hidaka	57454-964	1384

7590 09/09/2005
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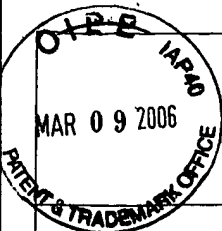


EXAMINER	
NGUYEN, VAN THU T	
ART UNIT	PAPER NUMBER
2824	

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

MAR 13 2006



Supplemental Notice of Allowability

Application No.

10/615,379

Examiner

VanThu Nguyen

Applicant(s)

HIDAKA, HIDETO

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to phone conversation with applicant's representative regarding claims 20-24.
2. ☒ The allowed claim(s) is/are 13-24.
3. ☒ The drawings filed on 7/9/03 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/832025.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

VanThu Nguyen
VanThu Nguyen
Primary Examiner
Art Unit: 2824

MAR 13 2006